

the section of most importance to the naturalist. The following passage, from p. 37, may be quoted as a good example of the closeness of the author's observations:—

"Most sportsmen," he writes, "will have noticed that duck when travelling prefer flying over water; even when passing from one sheet of water to another they will avoid the land if they can. This may be said to be a hard and fast rule with all the true diving ducks, but not with the surface feeders, such as mallard, wigeon and teal; for when they in their flight observe the waters for which they are heading, they are as likely as not to cut over large extents of land to reach their desired haven, especially if they have been much shot at at any given point on their usual water route."

The text-figures in the appendix are especially intended to illustrate the modes in which different species of duck rise from the water, and the formation they assume when in the air. One exhibits the manner in which mallard and teal "scoot" along the surface of the water in close phalanx before rising; a second (herewith reproduced) displays the "bunched" formation assumed by eiders

COOPERS HILL COLLEGE.

THE report on this institution by the body called, on the *lucus a non lucendo* principle, the "Board of Visitors," was published last week so shortly before the House of Commons adjourned for the Easter recess that there was not time to take any parliamentary action.

The day after we went to press a letter appeared in the *Times* from Colonel Pennycuik, the president of the College who preceded Colonel Ottley, from which we make the following extracts:—

Sir,—The final decision of the Secretary of State for India, after the inquiry promised in his letter to Sir William Anson, has now been announced, and has justified the opinion expressed by every one acquainted with the facts, that the inquiry in question would be a farce, the Board of Visitors, by whom the inquiry was conducted, being already committed to an opinion, and its own competence being one of the very questions on which an inquiry was most urgently required.

Lord George Hamilton's letter to Sir William Anson repeats the libels contained in his reply to the deputation which waited on him earlier in the year, that the college "is in such a condi-

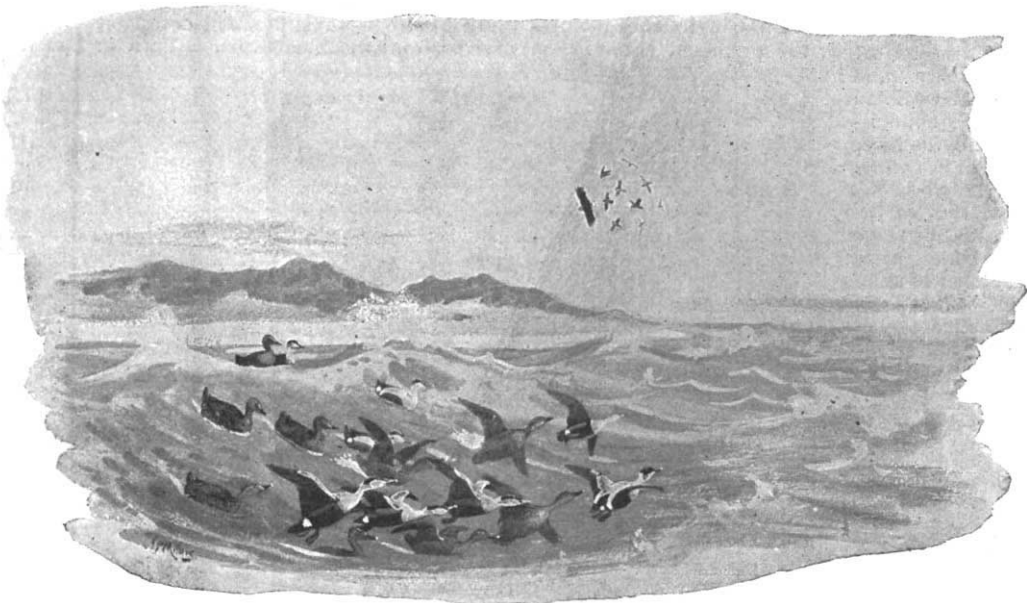


FIG. 2.—Eiders rising and showing bunched formation. From "The Wildfowler in Scotland."

when rising; while a third shows the swallow-like flight and linear formation so characteristic of the long-tailed duck.

For many of the species referred to the author well says that the illustrations best display the manner in which they severally leave the water when alarmed. When illustrations are lacking, excellent descriptions are given, as witness the following:—

"Shovellers are easily recognised when they rise from a marsh by the rattling noise they make, and I have heard them designated as 'rattle-wings' in more than one locality. They ascend abruptly at first, and fly rather like wigeon, but more easily and gracefully. They are adepts at turning, and seem to enjoy in spring beating up and down for hours together over the marsh which they intend to make their summer home. They do not fly very high as a general rule."

With this quotation we take leave, regretfully, of what is in every respect a very charming book, acceptable alike to the lover of art, the sportsman and the naturalist, and forming a handsome addition to the works allowed a permanent place on the drawing-room or library table.

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tion that it must be either reformed or abolished," and that it is "a burden upon the Indian revenues." Both these statements, unless they have been justified by something that has happened since the end of 1899, are absolutely untrue. At that date the number of candidates for entrance far exceeded the number for whom accommodation was available; the standard of the entrance examination had been steadily raised during the three previous years, and was still further raised in 1900; the college accounts during the same years showed a handsome surplus of income over expenditure; and the reputation of its students for practical efficiency stood at the highest possible level; its associate's diploma was accepted by the Institution of Civil Engineers as equivalent to their own associate's examination, and this latter examination was passed, while still at the college, by many students who did not succeed in obtaining that diploma; every student who obtained the ordinary diploma of the college, and some who did not, obtained useful employment within a few months after leaving the college. When and whence arose the necessity for "reform or abolition" in an institution which eighteen months ago was producing such results as these?

In his reply to the deputation Lord George Hamilton stated that shortly after he came into office—*i.e.* in the end of 1895 or early in 1896—he "determined to reorganise" the college as an alternative to abolition. If he did, I can only say that he

kept this determination a most profound secret from the college authorities.

I had three personal interviews with him during 1896 and 1897, and neither then nor at any other time while I was president of the college did he give the smallest hint that any dissatisfaction was felt with its condition (except on financial grounds) or that anything in the shape of reorganisation was contemplated or desired; I challenge production of any official document pointing to the necessity for any reorganisation, or for any change beyond those slight alterations which are from time to time necessary in every living organism. A Minister would deserve impeachment who really held the views which Lord George Hamilton professes to have held in 1896, and took no steps to give effect to those views, but continued to speak, publicly and privately, in the highest praise of an institution with which he was in reality so profoundly dissatisfied.

The committee of 1895, to which Lord George Hamilton refers, and whose proceedings occupy so large a space in the Blue-book, did not deal at all with the question of efficiency nor with the teaching staff, but with the financial question alone, a question which at that time appeared somewhat pressing, but which has lost its interest in view of the increasing prosperity of the college during the years succeeding 1895; this latter fact is concealed in the Blue-book by the ingeniously simple process of giving the accounts only down to 1895 and suppressing those of the later years.

The India Office have striven to represent the question at issue to be whether the personal interests of the professors concerned are to outweigh the interests of the public service. The real question is not this, but whether these latter interests require or justify the drastic changes which have been made.

With an experience of the Indian Public Works Department and of Coopers Hill considerably greater than that of the present president, I assert most positively that they do not, and am prepared to prove this assertion to the satisfaction of any unprejudiced authority. I believe that I could prove it to the satisfaction of the Secretary of State himself, if I could get at him without the intervention of a prejudiced board or of hostile officials.

It is hoped that some means will yet be found to prevent irreparable injury from being inflicted on an institution which has such a splendid history and has done such signal service to our Indian Empire as Coopers Hill.

Yours faithfully,

JOHN PENNYCUICK, Col. R.E. (late President R.I.E.C., Coopers Hill).

Camberley, April 2.

With regard to the Report itself, which contains the evidence taken by the Board of Visitors, we have received the following from a Correspondent.

After a good deal of pressure both from within and from without the Houses of Parliament, the Secretary of State for India agreed to hold an inquiry into the condition into which the Royal Indian Engineering College at Coopers Hill has fallen under the present régime. This inquiry was to be held by a more or less newly constituted body. Lord George Hamilton, however, declined to submit the question of the dismissal of seven of the professors and teachers to an independent body, but he offered to allow the Board of Visitors to hold an inquiry into the justice of the sentences they had themselves pronounced. Adopting the principle familiar to readers of "Through the Looking-Glass," the Secretary of State permits first the judgment and then the trial. On the same principle, the Board of Visitors, into whose competency it is perhaps the most important matter of all to inquire, having acted as judges, not to say executioners, now appear in the rôle of prosecuting counsel.

The duties of the Board of Visitors of Coopers Hill seem nowhere to be very clearly defined. But by all analogy the staff of the College should have the right to appeal to the Board, and such an appeal should be listened to with impartiality. The Blue-book issued on April 1, which contains the account of the inquiry, shows, however, the very reverse of a judicial spirit. One of the disadvantages of the method of sentence first and trial

afterwards is that instead of making "the punishment fit the crime" it becomes imperative to make the crime fit the punishment, and this the Board of Visitors have most sedulously attempted. They evidently felt they must "save their face" at no matter what cost to the institution whose interests they are supposed to protect.

Throughout the inquiry the dismissed professors and teachers were subjected to a hostile examination which contrasts most strangely with the friendly tone adopted to the president of the College and to other members of the staff, except when the evidence of the latter tended in favour of their dismissed colleagues and against the proposals of the president. The inquiry was rendered nugatory by the rules laid down for its conduct by the India Office. It was ordered that the evidence of each member of the staff should be rigidly restricted to the effect of the proposed changes on the teaching of his own subject and on himself personally, thus preventing material evidence being given on many points of vital importance to the welfare of the College. The Board of Visitors further limited the oral evidence by restricting the staff to the answering of certain questions prepared by the Board. The aim of Sir Charles H. T. Crossthwaite, the chairman of the Board, was apparently to make each of the gentlemen dismissed admit that his retirement was for the benefit of the College. Evidence was continually ruled out because, in the opinion of the chairman, it was of a personal nature; yet Colonel Ottley was allowed to indulge in personalities to an almost unlimited extent.

Throughout the inquiry the Board made little or no attempt to decry the ability or the efficiency of the gentlemen concerned. That was an impossible line, but their attitude throughout was one of

"Willing to wound, and yet afraid to strike,
Just hint a fault, and hesitate dislike."

Evidence exists both in the report of the inquiry and elsewhere that some at least of the Board were unacquainted with the contents of the report contained in the first Blue-book, a report purporting to have been drawn up by themselves. This is possibly to be accounted for by the indecent haste with which that document was considered and signed. More than one member of the Board was unaware that he had recommended such wholesale dismissals. The chairman and Sir W. S. S. Bisset express ignorance of the recommendation of the Board that the professor of electrical engineering should teach chemistry and physics in addition to his own subject, and of the fact that this extraordinary arrangement has had the approval of Lord George Hamilton. The Board knew so little of the staff of the College that they inquired after an instructor who has been dead for some years.

A careful examination of the Blue-book and of the minutes of the evidence reveals a wholesale repudiation by the Board of its previous recommendations. They repudiate the time-table incorporated in the first Blue-book and recommended for adoption by themselves. Perhaps the rejection of this document is the wisest thing the Board has done. They repudiate their own arrangement for the teaching of physics and electrical engineering. They repudiate their own arrangement for the teaching of mathematics, and they repudiate their own arrangement for the teaching of engineering.

One of the saddest features of the whole inquiry is the persistent effort made by both the Board and the president to belittle the status of the College. Coopers Hill in the past has stood high amongst the few institutions for scientific education in this country. It has done a great public service to India, and the prestige attached to its name is highly valued by the Government in India. Yet throughout the inquiry the Board compare it to a school, or to a technical college. Sir William Preece finds its nearest analogy in a

Metropolitan polytechnic. Finally, the president is desirous of following the lines adopted at Woolwich and Sandhurst, oblivious of the fact that these are military institutions and that Coopers Hill is a civil scientific College. The proper arrangement for the conduct of such a college as Coopers Hill is, in the opinion of Colonel Ottley, that there should be no inter-communication among the staff, but that each member of the staff should communicate alone with the president. The danger of this system of private conferences as leading to misrepresentation is exemplified by the case of Prof. Hearson, whose private consultations with the president are presented in such an extraordinary light by Colonel Ottley (Blue-book, p. 54). It is probably due to this that Prof. Hearson has been dismissed, though the reason adduced by the president was that Dr. Brightmore was debarred from teaching hydraulics, "his strongest subject," because that subject had been allotted to Prof. Hearson. There is, however, conclusive evidence that both professors were desirous of effecting an interchange of work by which hydraulics would have been handed over to Dr. Brightmore. This evidence the Board of Visitors ignore. Another result of this plan of separate conferences has been shown during the past year. The College has been divided into a series of separate camps. Tempted by the secret offers of the president, some of the junior members of the staff have consented to supplant their seniors for the modern equivalent of a mess of pottage, which appears, in this instance, to be something under 100*l.* a year.

The only charge against the College which appears in the report—and if any other existed we may feel sure the Board of Visitors would have set it forth—is that certain of the telegraph men have been found to be unsatisfactory, and that in some respects the telegraph branch might be improved. No fault of any kind is found with the training of the engineering students, who form by far the larger part of what is essentially an engineering college.

The criticisms on the telegraph men, of whom there are about three a year, is contained in Appendix 12 of the Report, pp. 131–146; and Mr. Pitman, who writes therein, expressly states that his "object is not to unduly criticise the course of instruction at the Coopers Hill College, *which has supplied the Department with so many excellent officers,*¹ but to bring to the notice of the responsible authorities that it would be possible to greatly improve the course of instruction and turn out officers with a greater knowledge of the theory and practice of Indian telegraphy than they can now obtain." This report, which is obviously intended, not as an adverse criticism, but as a friendly suggestion to the staff for improvement in details, expressly states that all the physical laboratory work (for which Mr. Shields is responsible) is excellent.

We have searched the Blue-book in vain for evidence that the Board of Visitors have tried to discover whether any of the suggestions made have been adopted, though Mr. Shields does manage to tell them that those referring to his part of the work have been adopted as far as time permits. And yet Mr. Shields is sent away. We happen to know that it was absolutely necessary for the Board to get rid of Mr. Shields because his successor had already been appointed! and because, moreover, Colonel Ottley had informed that successor, in the interval between the dates of the correspondence between Sir Wm. Anson and Lord George Hamilton (which was published in the daily papers) and the beginning of the inquiry, that whatever happened his appointment was secure! The bias of the Board is further shown by their conducting no inquiry into the admittedly excellent electro-technical course taken by Mr. Shields with some of the third year students.

¹ The italics are ours.

The defects of the telegraph students are not due to this or that part of the course being capable of slight improvement, for it is cordially admitted that many of them are excellent officers. The real reasons are given on pp. 121, 122. The calibre of some of the men during recent years has been exceptionally low, and owing to a variety of circumstances the abler men have not chosen to take telegraph appointments. This year, however, the standard is higher, and unless the break in their work, caused by the extraordinary plan adopted by the India Office of dismissing half the staff in the middle of the session, has too disastrous an effect on the students, they should take a high place in the service.

So far, therefore, from the indictment being justified that the College must be reformed or abolished, we can confidently assert that very few colleges, if subjected to such a hostile criticism as has been applied to Coopers Hill both by the president and by the Board, could show so clean a record.

A grave injustice has been done, not only to the seven gentlemen dismissed, but to all those whose services are "for the present" retained and to all who take part in the higher education of the country. The Board of Visitors have dropped their plea of economy because the changes have been shown not to be economical. They have dropped their plea of increased efficiency because it is impossible to maintain that to dismiss a man with Prof. Hearson's reputation and to replace him by a man of the reputation of Dr. Brightmore (who has not hesitated to inform the Board that he is unable to maintain discipline in his class) makes for efficiency. The Board of Visitors have, in fact, no plea to put forward for the action they have taken. They have relinquished their powers of judgment to a military autocrat who, backed up by other retired officials at the India Office, has absolute power over the destinies of the entire staff at Coopers Hill. Recent events in this country have not increased the faith of the people in the ability of either our public offices or of our army officers. Military methods have been shown to be imperfect and the scientific and educated opinion of the country will be slow to recognise the advisability of extending them to such institutions as the Engineering College at Coopers Hill.

NOTES.

As already announced, a meeting of the International Association of Academies will be opened at Paris on Tuesday next, April 16, in the rooms of the Institute of France. The following is a list of delegates appointed to represent the various academies which will constitute the Association:—Amsterdam: Prof. H. G. van de Sande Bakhuisen, president of the physico-mathematical section of the Academy; Prof. H. Kern, president of the section of letters; Prof. J. de Goeje. Berlin: Prof. H. Diels and Prof. W. Waldeyer, permanent secretaries of the Prussian Royal Academy of Sciences; Prof. R. Helmholtz; Prof. J. H. van 't Hoff; Prof. T. Mommsen; Prof. E. Sachau. Brussels: Lieut.-General de Tilly; Prof. P. Fredericq. Budapest: Prof. C. Than; Prof. I. Goldziher. Christiania, not yet announced. Göttingen: Dr. E. Ehlers and Dr. F. Leo, secretaries of the Society; Prof. E. Riecke. Copenhagen: Prof. J. L. Heiberg; General G. Zachariae. Leipzig: Prof. W. His; Prof. A. Fischer; Prof. H. Gelzer. London: Sir Michael Foster and Prof. A. W. Rucker, secretaries of the Royal Society; Dr. T. E. Thorpe, foreign secretary of the society; Sir Norman Lockyer; Sir Archibald Geikie; Prof. A. R. Forsyth; Prof. E. Ray Lankester; Prof. A. Schuster. Munich: Prof. W. Dyck; Prof. F. Lindemann; Prof. K. Krumbacher. Paris, Academy of Inscriptions and Belles Lettres: Count De Lasteyrie, president; MM. P. Berger, vice-president;